

# Frequency of Policy Recommendations in Epidemiologic Publications

Leila W. Jackson, MPH, Nora L. Lee, and Jonathan M. Samet, MD, MS

## ABSTRACT

**Objectives.** The purpose of this study was to determine the frequency and character of policy statements in epidemiologic reports.

**Methods.** The first author followed a standardized protocol and reviewed a random sample of articles selected from the *American Journal of Epidemiology*, *Annals of Epidemiology*, and *Epidemiology*. The second author reviewed all articles with policy statements and a 10% sample without such statements.

**Results.** Overall, 23.8% of the articles contained policy statements. *Annals of Epidemiology* and the *American Journal of Epidemiology* had similar frequencies of articles with policy statements (30% and 26.7%, respectively), while *Epidemiology* evidenced the lowest frequency (8.3%). The majority of policy statements (55%) pertained to public health practice; 27.5% involved clinical practice, and the remainder (17.5%) focused on corporate policies, regulatory actions, or undefined arenas. The frequency of policy statements differed according to first author's affiliation, type of publication, area of research, research design, and study population.

**Conclusions.** Although a minority of publications included policy statements, the inclusion of a statement seemed to be influenced by specific study characteristics. (*Am J Public Health*. 1999;89:1206–1211)

Epidemiology has been the principal research approach for identifying disease risk factors in human populations, and the findings of epidemiologic research, in its broadest sense, are the foundation for improving public health. In addition, the importance of policies as a vehicle for behavioral change and prevention is clearly recognized by those in the public health community.<sup>1–3</sup> Epidemiologic evidence can figure into the development of public health policy at multiple points in the policy-making process. Epidemiologists themselves often engage in the process and sometimes offer policy recommendations when they report research findings.

The issue of whether authors of journal articles should include policy recommendations with their research findings has been controversial.<sup>4–7</sup> Some epidemiologists and journal editors consider it inappropriate to move from research findings to policy recommendations in scientific publications.<sup>8,9</sup> One journal, *Epidemiology*, specifically disallows policy recommendations in original research articles.

Motivated by this controversy, we conducted a descriptive study of policy pronouncements made within epidemiology publications. We reviewed articles published in peer-reviewed journals to determine the frequency and character of statements being made by epidemiologists and to qualify the context in which policy statements are being made by researchers.

## Methods

### Journal and Article Selection

A representative sample of articles published between 1991 and 1995 (inclusive) was selected from 3 epidemiology journals. The journals were initially identified via the following search criteria: (1) published in English, (2) available within the Johns Hop-

kins Medical Institutions system, and (3) containing the stem “epidemiol” in the journal title. We searched the Johns Hopkins Medical Institutions library database and found 19 journal titles. The final selection of 3 journals was based on circulation size, whether the journal was peer reviewed, and the impact factor as calculated in the Science Citation Index Journal Citation Reports.<sup>10</sup>

The impact factor is a measure of the frequency with which the “average article” in a journal has been cited in a particular year, calculated as the ratio of the number of current citations of items published in the journal within the previous 2 years to the total number of items published in the journal within the previous 2 years. Journals of specific subfields of epidemiology, such as the *Journal of Clinical Epidemiology*, and journals limited to reviews, such as *Epidemiologic Reviews*, were not included in the final selection process.

The 3 journals selected were the *American Journal of Epidemiology*, *Annals of Epidemiology*, and *Epidemiology*, which had circulations of 3500, 1320, and 890, respectively (according to personal communications with the publishers). At the time of this study, the latest version of the Science Citation Index Journal Citation Reports (1994) listed the impact factors for the *American Journal of Epidemiology* and *Epidemiology* as 3.482 and 1.872, respectively. *Annals of Epidemiology* was not included in the Journal Citation Reports at that time.

The authors are with the Department of Epidemiology, School of Public Health, Johns Hopkins University, Baltimore, Md.

Requests for reprints should be sent to Nora L. Lee, Center for Epidemiology and Policy, Department of Epidemiology, Johns Hopkins School of Public Health, 615 N Wolfe St, Suite 6041, Baltimore, MD 21205-2179 (e-mail: nlllee@jhsph.edu).

This paper was accepted January 21, 1999.

To obtain a representative sample of articles published per year per journal, we used a simple random sample of 2 articles taken from every journal issue during the study period ( $n = 336$ ). Journal issues that were supplements or proceedings of symposia were excluded from the sampling frame, as were methodological papers, historical papers, letters to the editor, review articles, and book and software reviews. The focus of this study was on research articles and editorials. Editorials were included because any policy recommendations provided are generally based on the findings from 1 or 2 articles published in the same journal issue. These articles may or may not have been included in the sampling process.

### Data Collection

A standardized, computer-assisted data collection form was used to abstract relevant information from articles in the 3 journals. Epi Info (version 6.0; Centers for Disease Control and Prevention, Atlanta, Ga) was used to create the form, which was tested in a pilot study to ensure reliable and appropriate collection of data. To increase consistency between reviewers, we developed a handbook for the data collection process that included definitions and keywords for possible responses to the questions on the form. Data collected included information on author's affiliation, funding source, type of publication, study characteristics, and type of policy statement. All policy statements identified in the reviewed articles were entered in the database.

A policy statement was defined as any statement that implies, suggests, or recommends that an action be taken to improve the public's health, on the basis of evidence supporting such action. The statement had to connote an impact (direct or indirect) on the public's health and be based at least partially on the results of the research study. Policy statements were categorized into 4 areas: clinical practice, public health practice, corporate policy, and regulatory or legislative policy. Those that could not be placed into one of these categories were classified as "arena not defined."

### Quality Control

The first author reviewed all 336 articles by means of the standardized computer-assisted form. For quality control, the second author reviewed those articles found by the first author to contain a policy statement ( $n = 80$ ), as well as a 10% random sample of those not found by the first author to have a policy statement. The second author reviewed a total of 106 articles. Kappa statistics were

**TABLE 1—Frequency of Policy Statements (by Journal and Policy Arena) in Articles Published in *American Journal of Epidemiology*, *Annals of Epidemiology*, and *Epidemiology*: 1991–1995**

Policy Statement	Journal, No. (%)			Total
	<i>American Journal of Epidemiology</i>	<i>Annals of Epidemiology</i>	<i>Epidemiology</i>	
No	173 (73.3)	28 (70.0)	55 (91.7)	256 (76.2)
Yes	63 (26.7)	12 (30.0)	5 (8.3)	80 (23.8)
Total	236 (100)	40 (100)	60 (100)	336 (100)
Policy arena				
Clinical practice	16 (25.4)	4 (33.3)	2 (40.0)	22 (27.5)
Public health practice	39 (61.9)	4 (33.3)	1 (20.0)	44 (55.0)
Corporate policy	2 (3.2)	0 (0.0)	0 (0.0)	2 (2.5)
Regulatory–legislative	1 (1.6)	0 (0.0)	0 (0.0)	1 (1.3)
Arena not defined	4 (6.3)	4 (33.3)	2 (40.0)	10 (12.5)
Other	1 (1.6)	0 (0.0)	0 (0.0)	1 (1.3)
Total	63 (100)	12 (100)	5 (100)	80 (100)

calculated as an indication of inter-reviewer reliability (data not presented). There was high agreement on the presence of a policy statement in an article (83%); agreement on other study variables was above 70%.

### Data Analysis

The overall frequency of policy statements and frequencies stratified by journal, policy arena, study characteristics, and study population were calculated.

## Results

Of the 336 articles reviewed, 236 were from the *American Journal of Epidemiology* (monthly publication during the study period), 40 were from *Annals of Epidemiology* (bimonthly publication), and 60 were from *Epidemiology* (bimonthly publication during the study period). Overall, 23.8% of the articles contained a policy pronouncement. Of these policy pronouncements, 88.8% were from original research articles, 10.0% were from editorials, and 1.3% were from a meta-analysis. As shown in Table 1, the frequencies of articles in the *American Journal of Epidemiology* and *Annals of Epidemiology* containing policy statements were similar (26.7% and 30.0%, respectively), whereas *Epidemiology* had the lowest frequency of statements (8.3%). The combined frequency for the *American Journal of Epidemiology* and *Annals of Epidemiology* was 27.2%.

Table 1 also presents the frequencies of statements by policy arena. The majority of the policy statements were made in the areas of public health practice (55%) and clinical practice (27.5%). The types of statements made within journals differed slightly, with the *American Journal of Epidemiology*

including more statements related to public health practice ( $n = 39$ ) than clinical practice ( $n = 16$ ), *Annals of Epidemiology* having statements equally distributed in these 2 areas ( $n = 4$ ), and *Epidemiology* including more statements related to clinical practice ( $n = 2$ ) than public health practice ( $n = 1$ ). Definitions and examples of policy statements from each area are provided in Table 2. Frequencies of policy pronouncements by various study characteristics and study populations are presented in Table 3.

### Study Characteristics

Approximately 30% of articles written by authors from government or public health organizations contained policy statements, as compared with 20% of articles written by university authors. The frequency of policy statements was similar within each funding source category (25%), with the exception of studies funded by public health organizations (11%). Editorials included a greater frequency of statements (32%) than research articles (23%). Articles on clinical trials contained a policy statement 50% of the time, while those involving other study designs had policy statements 20% to 30% of the time. More than 50% of articles in the areas of infectious disease and injury had pronouncements, while articles in other research areas had much lower frequencies (7%–20%).

### Study Populations

Studies including only male participants had a higher frequency of statements than did those including only female participants. Articles on children included a policy statement 80% of the time; those investigating fetuses (29%), infants (20%), adults (26%), and the elderly (9%) had lower frequencies.

**TABLE 2—Examples of Policy Statements From Articles Published in *American Journal of Epidemiology*, *Annals of Epidemiology*, and *Epidemiology*: 1991–1995**

Policy Type and Definition	Example of Statement
Clinical practice (statements that imply, suggest, or recommend changes in decision-making within the context of patient care by a physician)	In cases of depression in the elderly, if a patient with functional disability perceives emotional support to be inadequate and few children make weekly visits, then primary care physicians might consider more frequent follow-up, contacting children, or even trials of antidepressants. <sup>45</sup> Gay men with non-Kaposi's sarcoma AIDS should be considered at high risk for developing Kaposi's sarcoma, closely followed for detection of this disease, and encouraged to enroll in trials of prophylaxis for Kaposi's sarcoma as they become available. <sup>46</sup>
Public health practice (statements that imply, suggest, or recommend changes in current public health practice [nonlegislative and nonregulatory changes] within any population, defined by any level of government or health organization)	Because of the increasing popularity of microwave ovens, health officials should educate the public regarding the potential danger when microwave ovens are used to reheat foods which may be contaminated. <sup>47</sup> It is obvious that spinal cord injuries have extreme financial consequences, and that preventing them would make a tremendous impact on the health care system. This should be a public health priority. <sup>48</sup>
Corporate policy (statements that imply, suggest, or recommend changes in current employer policies that affect the health and welfare of a company's employees, the users of a company's product, or those exposed to a company's product or by-product)	Strong consideration should be given to making immunity to rubella and other preventable diseases a condition of employment for health care facilities. <sup>49</sup>
Regulatory–legislative (statements that imply, suggest, or recommend changes in current regulation or legislation that affect the health and welfare of the general population, as defined by any level of government)	Laboratory analyses to investigate the nitrosamine content of beer should be carried out in all countries concerned with beer consumption, and lower nitrosamine levels should be enforced. <sup>50</sup> [T]he present results indicate that current air quality standards do not fully protect the health of some population groups. <sup>51</sup>
Arena not defined (statements that imply, suggest, or recommend a change or a practice but do not specify in what arena this change or practice should be carried out)	As has been suggested by others, weight control early in life may be the most effective means of preventing cardiovascular risk from developing. <sup>52</sup> For high-protein foods, including legumes, the likelihood of a <i>C. perfringens</i> outbreak can be diminished by serving the food hot on the day prepared or through strict observance of cooling, heating, and holding temperature practices. <sup>53</sup>

Articles with an African study population had a statement 83% of the time, while studies of Asians or Pacific Islanders and studies in the Americas had statements 31% and 20% of the time, respectively. Among studies of US populations, the frequency of policy statements varied by race or ethnicity of the population. Articles including only Whites had a policy statement 37% of the time, while none of the articles including only African-American populations had policy statements. Among articles including only Asian-American populations, 50% had statements, and the 1 article including only Native American populations contained a statement.

## Discussion

The links between epidemiologic investigation and public health intervention have grown in complexity since the era of John Snow and the Broad Street pump or James Lind and citrus fruits, in part as a result of the growth of regulatory agencies and other health policy-making bodies. A seeming disconnection between epidemiology and health policy has been noted by others in public health<sup>11</sup> and policy-making, as exemplified by the introduction by Congress of the term “sci-

ence-based policy.” For example, Milton Teris reminds us that prevention of morbidity and premature mortality is the primary goal of public health practice and that epidemiologic findings should “play a major role in the formulation of health policy.”<sup>12(p323)</sup> How this should be achieved, however, is often unclear, and “effective skills in translating results into appropriate policy, programs, and interventions are inherently tricky, and often politically controversial.”<sup>13(p375)</sup> This is one of the most difficult issues facing epidemiologists.<sup>14</sup>

Making policy recommendations within the context of study results is one contribution that epidemiologists can make to the dialogue between researchers and public health policy-makers. Identifying the characteristics of a study that make an author more likely to include a policy recommendation can provide insight into the role taken by some epidemiologists in the policy decision-making process. Although only a minority of articles contained policy recommendations, this study was able to identify some of the characteristics related to the presence of a recommendation.

Research in the areas of injury and infectious disease most frequently included a policy recommendation. Injury epidemiology has close ties to policy, because there is often a clear link between risk factor and outcome

that can lead to fairly rapid policy changes. An example of this is the required use of bicycle helmets<sup>15–19</sup> and motorcycle helmets,<sup>20–22</sup> which has resulted in fewer head injuries.

The link between findings in infectious disease epidemiology and policy recommendations is not surprising. Preventive measures based on epidemiologic data have had dramatic effects on epidemics such as cholera<sup>23</sup> and more modern-day concerns such as HIV infection.<sup>24,25</sup> The relatively short latency periods and the comparatively clear identification of agent, vector, and host frequently allow for more rapid policy recommendations and actions than are possible in other areas of public health, such as chronic disease or occupational health. For example, tuberculosis outbreaks in homeless shelters<sup>26</sup> and the high prevalence of infection among homeless populations<sup>27–29</sup> prompted the Centers for Disease Control and Prevention (CDC) to convene a group of consultants to help develop strategies for addressing this problem. As a result of these strategies, the CDC issued recommendations to state and local health departments.<sup>30</sup>

The etiologies of chronic diseases are less well defined owing to longer latency periods between exposure and disease and

**TABLE 3—Frequency of Policy Statements, by Study Variables, in Articles Published in *American Journal of Epidemiology*, *Annals of Epidemiology*, and *Epidemiology*: 1991–1995**

Variable <sup>a</sup>	No. of Articles Reviewed (n = 336)	Articles Having Policy Statements, Within Variable Category, %
First institutional affiliation		
University	213	20.2
Government	69	30.4
Hospital	21	19.0
Public health organization	3	33.3
Corporate–industry	3	0
First funding source		
Government	171	24.6
University	4	25.0
Corporate	8	25.0
Public health organization	9	11.1
Charitable organization	8	25.0
Type of publication		
Original research article	310	22.9
Editorial	25	32.0
Meta-analysis	1	100.0
Area of research		
Chronic disease	208	20.2
Infectious disease	43	53.5
Occupational	14	7.1
Genetic	8	12.5
Injury	6	66.6
Reproductive	37	13.5
Type of study design		
Cross sectional	76	23.7
Ecologic	4	25.0
Case–control	82	20.7
Cohort	114	19.3
Nested case–control	9	33.3
Clinical	6	50.0
Gender of study population		
Male	65	23.1
Female	76	17.1
Both male and female	178	25.8
Age of study population <sup>b</sup>		
Fetus (conception–birth)	17	29.4
Infant (birth–0.9 year)	5	20.0
Child (1–12.9 years)	5	80.0
Adult (18–64.9 years)	58	25.9
Elderly (65+ years)	21	9.5
Geographic region of study population		
United States–Canada	230	24.3
Central–South America	5	20.0
Europe	58	13.8
Africa	6	83.3
Asia and Pacific Islands	13	30.8
Australia and New Zealand	5	0
Ethnicity/race of study population		
White only	30	36.7
African American	3	0
Asian American	4	50.0
Non-US population	96	21.9
Native American, Eskimo, or Aleut	1	100.0

<sup>a</sup>Categories such as other and unknown were excluded.<sup>b</sup>No studies exclusively on teenaged populations.

the multiple sources of exposure usually involved (e.g., occupational, environmental, and genetic). For example, a clear relationship between smoking and cancer was first identified in 1950.<sup>31–33</sup> There was no public health intervention, however, until the association was recognized by the US surgeon

general in 1964,<sup>34</sup> leading to health warning labels on cigarette packages. Another 10 years passed before restrictions were placed on cigarette advertising, and 30 years passed before increased taxes on cigarettes were implemented to reduce the number of smokers in the United States.<sup>35</sup>

Well-conducted epidemiologic studies with significant results are generally accepted as the strongest type of scientific evidence in questions of human exposure and disease.<sup>36,37</sup> Our descriptive study suggests, however, that there is an overall reluctance among epidemiologists to provide policy recommendations in their research publications, which often include a brief summary of the relevant literature along with their own findings. We found that the majority of research articles either contained no policy recommendations or included weak statements. This differs from review articles, as shown by Weed and Gorelic<sup>38</sup> in their examination of 22 review articles on the links between alcohol and breast cancer and between vasectomy and prostate cancer. They found 50% of the review articles to contain public health recommendations, which is a higher percentage than the 27.2% found in our study for the *American Journal of Epidemiology* and *Annals of Epidemiology* combined.

The concern among research epidemiologists in making policy recommendations appears to be that of advocacy vs objectivity. Although there has been discussion of this topic for many years, discussions have recently become more vocal and public. For example, the editorial policy of the journal *Epidemiology*, according to which “opinions or recommendations about public-health policy should be reserved for editorials, letters or commentaries, and not presented as the conclusions of scientific research,” has recently been debated in commentaries and letters to the editor.<sup>4–9</sup> This editorial policy explains the relatively small number of policy statements included in *Epidemiology* (8.3%).

Poole and Rothman<sup>39</sup> also warn that being a good epidemiologist does not make one a good public policy analyst, because public health policy decisions are influenced by not only science but also economic, social, and political factors.<sup>40</sup> Poole and Rothman clearly rule out advocacy from the scope of activities: “Epidemiologists can help, not by calling for a drug to be removed from or remain on the market or for labels to be changed, but by communicating the existing epidemiologic findings and their public health implications effectively to policy makers.”

A few organizations have established their own guidelines for the appropriate roles of epidemiologists as advocates. Not surprisingly, these guidelines, published by the Industrial Epidemiology Forum, the Council of International Organizations of Medical Sciences, and the International Epidemiological Association, are not all in agreement.<sup>41</sup> According to the Industrial Epidemiology

Forum's "Ethical Guidelines for Epidemiologists," the epidemiologist's obligation is limited to the dissemination of research findings; interpretation of evidence is left to the users of the information: "all information necessary to make informed decisions about health and disease must be provided, and provided in a form readily interpretable by informed readers."<sup>42(p166S)</sup>

The Council of International Organizations of Medical Sciences, in *International Guidelines for Ethical Review of Epidemiological Studies*, acknowledges that investigators may become advocates, but "their advocacy must be seen to rely on objective, scientific data."<sup>43(p18)</sup> The International Epidemiological Association, in its *Proposed Ethics Guidelines for Epidemiologists*, suggests that "value-laden statements made and actions taken in the role of advocate should... be clearly distinguished from those deriving from the role as scientist."<sup>44(p5)</sup> These guidelines concede, however, that "even purely scientific interpretations of factual evidence in epidemiology, as in other sciences, are rarely value-free."<sup>44(p5)</sup>

While the present descriptive study does not answer the controversial question of what role the epidemiologist should play in the policy decision-making process, it does increase understanding of the context in which epidemiologists are or are not making policy statements. This is a first look at the dynamics between study characteristics and authors' inclusion of policy pronouncements. It is intended to provide a basis for further examination and dialogue on the role of epidemiologists in the policy-making process. The focus of future research on this topic should include, among other approaches, case studies of time to policy action after publication of significant findings. It would be useful to examine the historical time lines for various public health policies and to review the extent of involvement of epidemiologists in the policy development process. □

## Contributors

L. W. Jackson planned the study, collected and analyzed the data, and wrote portions of the paper. N. L. Lee collected the data, wrote portions of the paper, and edited the manuscript. J. M. Samet designed the study, supervised the data analysis, contributed to writing the paper, and edited the manuscript.

## References

- Schmid TL, Pratt M, Howze E. Policy as intervention: environmental and policy approaches to the prevention of cardiovascular disease. *Am J Public Health*. 1995;85: 1207-1211.
- Atwood K, Colditz GA, Kawachi I. From public health science to prevention policy: placing science in its social and political contexts. *Am J Public Health*. 1997;87:1603-1606.
- Brownson RC, Newschaffer CJ, Ali-Abarghouthi F. Policy research for disease prevention: challenges and practical recommendations. *Am J Public Health*. 1997;87:735-739.
- Macdonald SC. Authors should be expected to elucidate policy implications of empirical data [letter]. *Epidemiology*. 1993;4:557-558.
- Teret S. So what? *Epidemiology*. 1993;4:93-94.
- Diez-Roux AV, Benach J, Tapia JA. Should policy recommendations be excluded from epidemiologic research papers? [letter]. *Epidemiology*. 1994;5:637-638.
- Coughlin SS. A ban on policy recommendations in epidemiologic research papers? Surely, you jest! *Epidemiology*. 1994;5:257-258.
- Rothman KJ, Poole C. Science and policy making [editorial]. *Am J Public Health*. 1985;75: 340-341.
- Rothman KJ. Policy recommendations in epidemiology research papers. *Epidemiology*. 1993; 4:94-95.
- Garfield E. 1994 *SCI Journal Citation Reports. A Bibliometric Analysis of Science Journals in the ISI Database*. Philadelphia, Pa: Institute for Scientific Information Inc; 1995.
- Morrison AB. Public policy on health and scientific evidence—is there a link? *J Chronic Dis*. 1984;37:647-652.
- Terris M. Epidemiology as a guide to health policy. *Annu Rev Public Health*. 1980;1: 323-344.
- Cwikel JG. After epidemiological research: what next? Community action for health promotion. *Public Health Rev*. 1994;22:375-394.
- Gordis L. Ethical and professional issues in the changing practice of epidemiology. *J Clin Epidemiol*. 1991;44(suppl 1):9S-13S.
- DiGiuseppi CG, Rivara FP, Koepsell TD, Polisars L. Bicycle helmet use by children: evaluation of community-wide helmet campaign. *JAMA*. 1989;262:2256-2261.
- Vulcan AP, Cameron MH, Heiman L. Evaluation of mandatory helmet use in Victoria, Australia. In: *36th Annual Proceedings of the Association for the Advancement of Automotive Medicine*; October 5-7, 1992; Portland, Ore.
- Rodgers LW, Bergman AB, Rivara FP. Promoting bicycle helmets to children: a campaign that worked. *J Musculoskeletal Med*. 1991;8:64-77.
- Centers for Disease Control and Prevention. Injury-control recommendations: bicycle helmets. *MMWR Morb Mortal Wkly Rep*. 1995; 44(RR-1):1-17.
- Centers for Disease Control and Prevention. Bicycle helmet protection program—Canada, Australia, and United States. *MMWR Morb Mortal Wkly Rep*. 1993;44:203-210.
- Wilson D. *The Effectiveness of Motorcycle Helmets in Preventing Fatalities*. Washington, DC: National Highway Traffic Safety Administration, US Dept of Transportation; 1989. Report HS-807-416.
- Offner PJ, Rivara FP, Maier RV. The impact of motorcycle helmet use. *J Trauma*. 1992;32: 636-642.
- Centers for Disease Control and Prevention. Head injuries associated with motorcycle use—Wisconsin, 1991. *MMWR Morb Mortal Wkly Rep*. 1994;43:423-431.
- Snow J. On the mode of communication of cholera. In: *Snow on Cholera, Being a Reprint of Two Papers by John Snow, MD*. New York, NY: Commonwealth Fund; 1936:1-139.
- Connor EM, Sperling RS, Gelber R, et al. Reduction of maternal-infant transmission of human immunodeficiency virus type 1 with zidovudine treatment. *N Engl J Med*. 1994;331: 1173-1180.
- Centers for Disease Control and Prevention. Recommendations of the US Public Health Service Task Force on the use of zidovudine to reduce perinatal transmission of human immunodeficiency virus. *MMWR Morb Mortal Wkly Rep*. 1994;43(RR-11):1-20.
- Centers for Disease Control and Prevention. Drug-resistant tuberculosis among the homeless—Boston. *MMWR Morb Mortal Wkly Rep*. 1985;34:429-431.
- Slutkin G. Management of tuberculosis in urban homeless indigents. *Public Health Rep*. 1986;101:481-485.
- Sherman MN, Brickner PW, Schwartz MS. Tuberculosis in single-room-occupancy hotel residents: a persisting focus of disease. *NY Med J*. 1980;2:39-41.
- Barry MA, Wall C, Shirley L, et al. Tuberculosis screening in Boston's homeless shelters. *Public Health Rep*. 1986;101:487-498.
- Centers for Disease Control and Prevention. Tuberculosis control among homeless populations. *MMWR Morb Mortal Wkly Rep*. 1987; 36:257-260.
- Wynder EL, Graham EA. Tobacco smoking as a possible etiologic factor in bronchogenic carcinoma. A study of six-hundred-eighty-four proved cases. *J Am Med Assoc (JAMA)*. 1950; 143:329-336.
- Levin ML, Goldstein H, Gerhardt PR. Cancer and tobacco smoking. A preliminary report. *J Am Med Assoc (JAMA)*. 1950;143:336-338.
- Doll R, Hill AB. Smoking and carcinoma of the lung. Preliminary report. *Br Med J (BMJ)*. 1950;1:739-748.
- Bayne-Jones S, Burdette WJ, Cochran WG, et al. *Smoking and Health. Report of the Advisory Committee to the Surgeon General of the Public Health Service*. Washington, DC: US Dept of Health, Education and Welfare; 1964. Publication 1103.
- Centers for Disease Control and Prevention. State-specific prevalence of cigarette smoking—United States, 1995. *MMWR Morb Mortal Wkly Rep*. 1996;45:962-966.
- IARC *Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans, Supplement 4*. Lyon, France: International Agency for Research on Cancer; 1982.
- Guidelines for carcinogenic risk assessment. *Federal Register*. 1986;51:33992-34003.
- Weed DL, Gorelic LS. The practice of causal inference in cancer epidemiology. *Cancer Epidemiol Biomarkers Prev*. 1996;5:303-311.
- Poole C, Rothman KJ. Epidemiologic science and public health policy [letter]. *J Clin Epidemiol*. 1990;43:1270.
- Brownson RC. Epidemiology and health policy. In: Brownson RC, Petitti DB, eds. *Applied Epidemiology: Theory to Practice*. New York, NY: Oxford University Press Inc; 1998:349-387.
- Weed DL. Science, ethics guidelines, and advocacy in epidemiology. *Ann Epidemiol*. 1994; 4:166-171.
- Beauchamp TL, Cook RR, Fayerweather WE, et al. Ethical guidelines for epidemiologists.

- J Clin Epidemiol.* 1991;44(suppl 1):151S-169S.
43. *International Guidelines for Ethical Review of Epidemiological Studies.* Geneva, Switzerland: Council for International Organizations of Medical Sciences, World Health Organization; 1991.
  44. *Proposed Ethics Guidelines for Epidemiologists.* Oxford, England: International Epidemiological Association; 1990.
  45. Oxman TE, Berkman LF, Kasl S, Freeman DH Jr. Social support and depressive symptoms in the elderly. *Am J Epidemiol.* 1992;134:356-368.
  46. Hoover DR, Black C, Jacobson LP, et al. Epidemiologic analysis of Kaposi's sarcoma as an early and later AIDS outcome in homosexual men. *Am J Epidemiol.* 1993;138:266-278.
  47. Gessner BD, Beller M. Protective effect of conventional cooking versus use of microwave ovens in an outbreak of salmonellosis. *Am J Epidemiol.* 1994;139:903-909.
  48. Price C, Makintubee S, Herndon W, Istre GR. Epidemiology of traumatic spinal cord injury and acute hospitalization and rehabilitation charges for spinal cord injuries in Oklahoma, 1988-1990. *Am J Epidemiol.* 1994;139:37-47.
  49. Fraser V, Spitznagel E, Medoff G, Dunagan WC. Results of a rubella screening program for hospital employees: a five-year review (1986-1990). *Am J Epidemiol.* 1993;138:756-764.
  50. Riboli E, Cornée J, Macquart-Moulin G, Kaaks R, Casagrande C, Guyader M. Cancer and polyps of the colorectum and lifetime consumption of beer and other alcoholic beverages. *Am J Epidemiol.* 1991;134:157-166.
  51. Sunyer J, Anto JM, Murillo C, Saez M. Effects of urban air pollution on emergency room admissions for chronic obstructive pulmonary disease. *Am J Epidemiol.* 1991;134:277-286.
  52. Van Horn LV, Ballew C, Liu K, et al. Diet, body size, and plasma lipids-lipoproteins in young adults: differences by race and sex. The Coronary Artery Risk Development in Young Adults (CARDIA) Study. *Am J Epidemiol.* 1991;133:9-23.
  53. Roach RL, Sienko DG. *Clostridium perfringens* outbreak associated with minestrone soup. *Am J Epidemiol.* 1992;136:1288-1291.

## APHA REPRINT SERIES #3: *Homelessness in America*

**Edited by Daniel B. Herman and Ezra S. Susser**

This volume contains some of the most influential research that has been conducted to date on the problem of homelessness and specific conditions that are associated with homelessness. The articles share the methodological rigor, and the relevance to public health policy and practice that have long been hallmarks of the *American Journal of Public Health*.

The collection is organized into three sections:

- **"The Problem of Homelessness: Description, Scope, and Underlying Causes,"** includes several editorials that address underlying causes and issue calls to action
- **"Individual-Level Risk Factors for Homelessness,"** includes several of the best designed studies conducted to date that illuminate the role played by individual-level factors in vulnerability to homelessness
- **"Health Conditions among Homeless People,"** addresses both a broad range of health conditions that disproportionately affect homeless people as well as issues of utilization and access to health care services

**1998 • 150 pp • Stock No. 808/HOAD98**

**\$30 Non-APHA Members • \$25 APHA Members**



**American Public Health Association • Publications Sales**

P.O. Box 753, Waldorf, MD 20604-0753

Tel: 301/893-1894; Fax: 301/843-0159; Web: [www.APHA.org](http://www.APHA.org); E-mail: [APHA@TASCO1.com](mailto:APHA@TASCO1.com)